

NEBC MEETING NEWS

May 1997. Dr. Keith Killingbeck of the University of Rhode Island spoke on “The ecology of desert shrubs: Encounters with paradox and dogma in the arid Southwest.”

As demonstrated by his spectacular photographs, the deserts are places of vast open spaces, intricate details, and varied cultural history, made unique by the vivid contrasts of light and shadow, desolation and profusion.

Initially intrigued by the physiology of nutrient resorption, Keith investigated the nutrient dynamics of ocotillo, one of the Sonoran Desert’s most spectacular flowering plants. Ocotillo is drought-deciduous, forming leaves up to 6 times a year in response to rainfall. He hypothesized that, with this large investment of nutrients and energy in a nutrient-poor environment, the plant should have extraordinary means of reabsorbing nutrients. Through innovative research techniques, the initial research found that researchers who purchase large quantities of pantyhose, twine, and fingernail polish attract attention in the small towns of the Southwest. The research showed that ocotillo has very low nutrient resorption rates (lower than calculated for northeastern deciduous forests) but nutrient concentrations equivalent to those of more mesic plants, and that these rates were controlled by zinc—the critical metal cofactor for the enzymes that break down proteins and release nitrogen for resorption. Nutrient dynamics are controlled, not by adaptation to soil nutrient concentrations, but by soil metal concentrations.

Keith provided a visual tour of the two most interesting North American desert ecosystems. The Chihuahuan desert of Mexico and Texas is characterized by agaves, yuccas, barrel cactus, spectacular perennials such as bluebonnets and bladderpods, and by the ubiquitous creosote bush. Creosote bush is the dominant shrub in both deserts, and is actively invading desert grassland following overgrazing. Clones of this species have been shown to be the oldest known living plant, with documented ages of up to 10,000 years. The Sonoran desert of western Mexico, Arizona, New Mexico, and California has a somewhat different and more diverse flora, whose star players include Saguaro, organ pipe cactus, ocotillo, the fabulous boojum, teddy bear cholla, and palo verde.

Field Trip (June 6, 1997). Twenty-three Club members and guests met at The Holyoke Range State Park Notch Visitors Center in Hadley, MA, for a visit to the balds and barrens of Bare Mountain. The trip was led by Dr. Karen Searcy of the University of Massachusetts, who is conducting research on the flora and ecology of the barrens areas of the Holyoke Range. The group climbed the south face of Bare Mountain, up the weathered surface of the Triassic lava flow known as the Holyoke Diabase by geologists and locally as "traprock." Notable species in the open oak-hickory woods included *Oxalis violacea* (abundant and in full bloom), *Scirpus verecundus*, *Conopholis americana*, *Orobancha uniflora*, *Eupatorium purpureum*, *Anemonella thalictroides*, *Vaccinium stamineum*, *Asclepias quadrifolia*, *Viola triloba*, *Thalictrum revolutum*, and *Sanicula marilandica*. The open balds included "grassy balds" on weathered broken rock, dominated by *Schizachyrium scoparium* and *Danthonia spicata*, and "rock balds" on more solid rock. Notable species of the balds and their edges included *Asplenium platyneuron*, *Woodsia ilvensis*, *Krigia virginica*, *Arabis missouriensis*, *Corydalis sempervirens*, *Polygonum tenue*, *Carex umbellata*, *Pycnanthemum incanum*, *Celtis occidentalis*, *Cardamine parviflora* var. *arenicola*, *Panicum depauperatum*, *Carex glaucodea*, *Potentilla arguta*, and *Senecio pauperculus*.

Field Trip (June 7, 1997). Hidden Valley Memorial Forest, Wendell, MA. Club members joined the Mount Grace Land Conservation Trust and Mrs. Mabel Cronquist for the dedication of the Hidden Valley Memorial Forest, an approximately 80-acre property owned by Arthur and Mabel Cronquist. Les Mehrhoff provided a summary and reminiscence of Art Cronquist's life and accomplishments, and Mrs. Cronquist described how they enjoyed camping on the site and exploring its forests and streams and the adjacent Wendell State Forest lands. Following the ceremony, a group of seven Club members, led by Matt Hickler and Karen Searcy, explored the property and initiated a floristic inventory. Although no rarities were encountered, over 100 species were recorded in the rich hemlock-northern hardwoods vegetation, along the rocky brooks, and in the drier oak-hemlock woods along the higher slopes. *Viola macloskeyi*, *V. rotundifolia*, *Panax trifolius*, *Trillium undulatum*, and numerous *Carex* species were noted.

June 1997. Dr. Karen Searcy of the University of Massachusetts spoke on the "Balds on Bare Mountain," her work with Paul Godfrey on the ecology and flora of the balds or barrens of the Holyoke Range. The Holyoke Range is a series of Triassic basalt flows known as the Holyoke Diabase, formed during rifting associated with the opening of the Atlantic. When Dr. Searcy started her research, she found that although the flora of the range had been well documented in the 1860–1880 period, there was a poor inventory and understanding of its grassland or bald sites, and no information on the status or persistence of rare species that had been documented from the area over 100 years previously.

Two types of balds occur on the south-facing slope of the range. Rock balds form where basalt is little weathered, with exposed outcrops of solid rock. These have a relatively low diversity, with an average of 15 species. Grassy balds form where the basalt is more weathered and broken into "clinkers," and are dominated by *Danthonia spicata* and *Schizachyrium*. The grassy balds have a higher diversity, with an average of 42 species. The total flora of the balds includes 124 species, with an exceptionally low contribution (2%) of non-native taxa. Lichens, not yet inventoried, form a major part of the plant community. Rare species, notably *Ranunculus fascicularis*, *Arabis missouriensis*, *Asclepias verticillata*, *Polygonum tenue*, *Verbena simplex*, and *Carex bicknellii*, frequently occur in the openings.

Knowledge of the successional status and vegetation dynamics of the balds is important for the protection of rare species populations. Dr. Searcy's research suggests that the balds are maintained by severe climate, particularly the much hotter surface temperatures, lower soil moisture, and higher winds than in the adjacent forests, which appear to inhibit the growth of woody plants and maintain the openings. Further research will focus on understanding the factors that preserve these balds and on understanding the population biology of the rare species that occur on these habitat "islands."

—LISA A. STANDLEY, Recording Secretary.